MODIS Collection 6 Clear Sky Restoral (CSR): Filtering cloud mask "not clear" pixels

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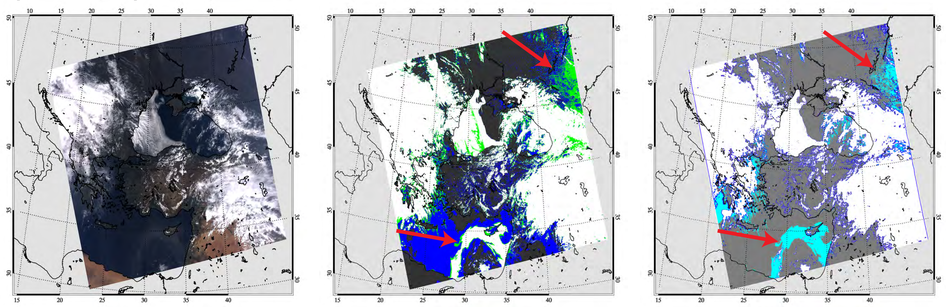
C6 CSR ALGORITHM

Correctly identifying cloudy pixels appropriate for the MOD06 cloud optical and microphysical property retrievals is accomplished in large part using results from the MOD35 1km cloud mask tests (note there are also two 250m sub-pixel cloud mask tests that can convert the 1km cloudy designations to clear sky). However, because MOD35 is by design clear sky conservative (i.e., it identifies "not clear" pixels), certain situations exist in which pixels identified by MOD35 as "cloudy" are nevertheless likely to be poor retrieval candidates. For instance, near the edge of clouds or within broken cloud fields, a given 1km MODIS field of view (FOV) may in fact only be partially cloudy. This can be problematic for the MOD06 retrievals because in these cases the assumptions of a completely overcast homogenous cloudy FOV and 1-dimensional plane-parallel radiative transfer no longer hold, and subsequent retrievals will be of low confidence. Furthermore, some pixels may be identified by MOD35 as "cloudy" for reasons other than the presence of clouds, such as scenes with thick smoke or lofted dust, and should therefore not be retrieved as clouds. With such situations in mind, a Clear Sky Restoral (**CSR**) algorithm was introduced in C5 that attempts to identify pixels expected to be poor retrieval candidates. Table 1 provides SDS locations for CSR and partly cloudy (**PCL**) pixels.

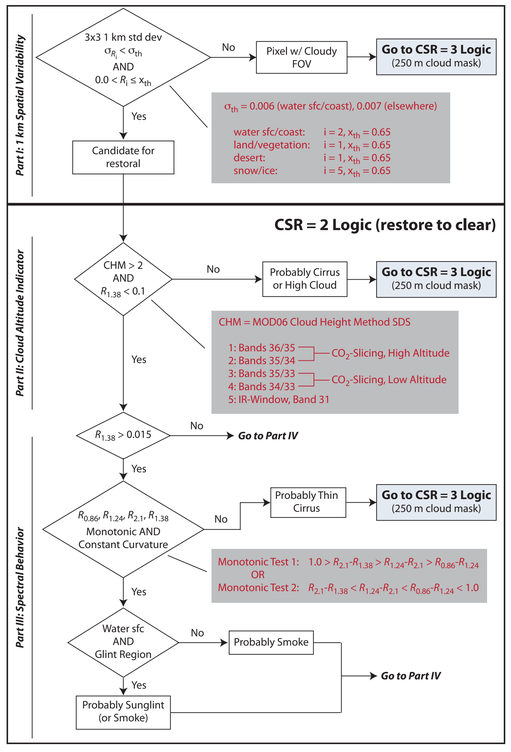
TABLE 1

Dataset	SDS Location
CSR Flag	**Quality_Assurance_1km**
Partly Cloudy Pixels	***<Parameter_Name>*_PCL**

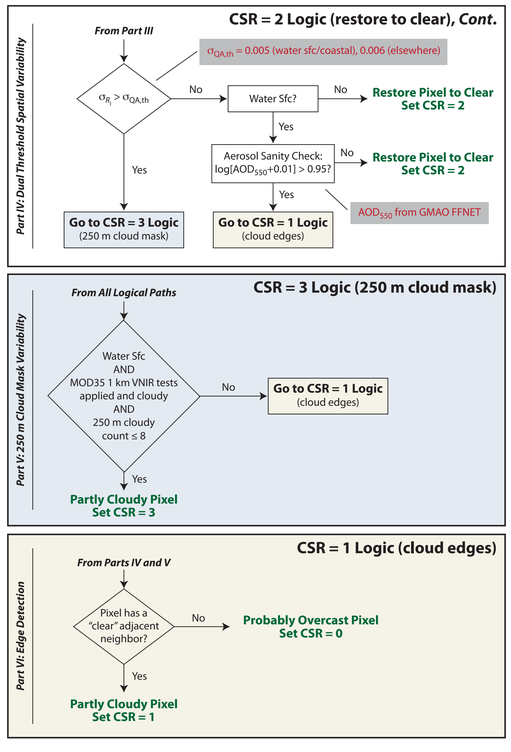
Aqua MODIS, 9 April 2005 (1050 UTC)



Clear-Sky Restoral (CSR) Logic

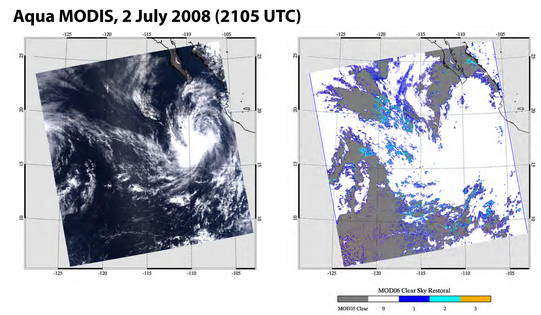


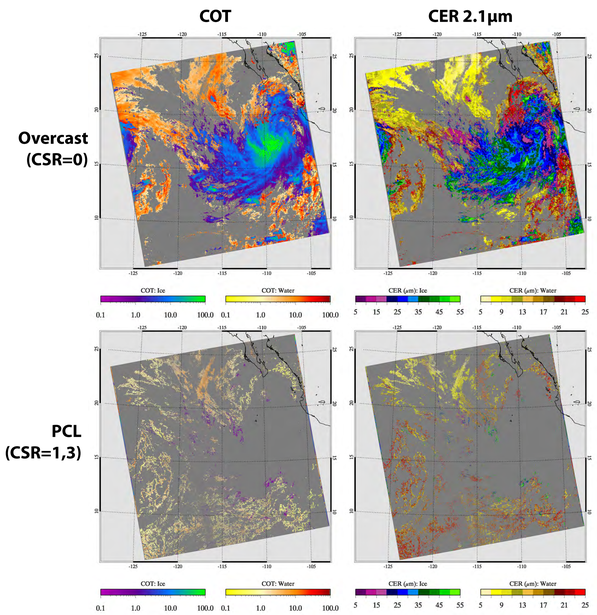
Clear-Sky Restoral (CSR) Logic (*Cont.*)



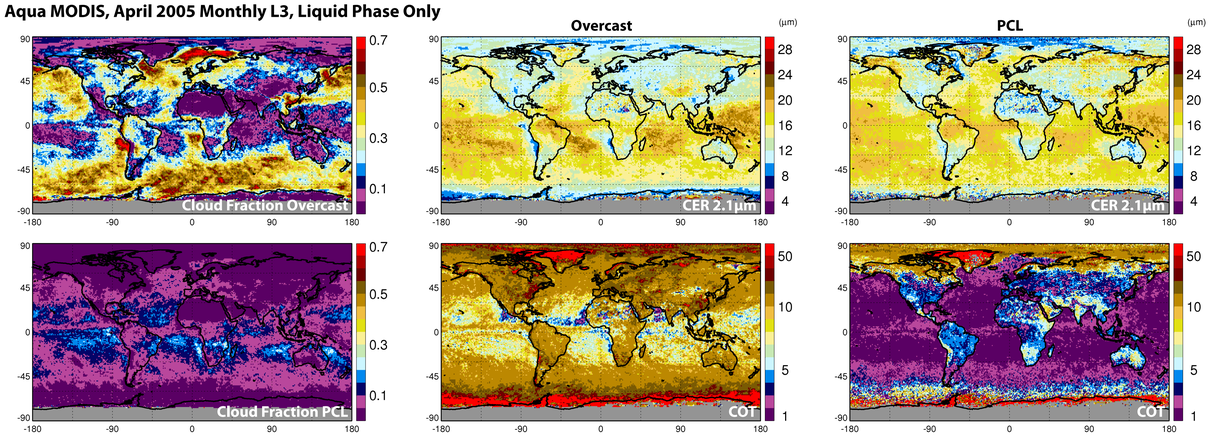
CSR FILTERING IN C6 MOD06

Aqua MODIS, 2 July 2008 (2105 UTC)





Aqua MODIS, April 2005 Monthly L3, Liquid Phase Only



Overcast - [Overcast+PCL]